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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,676	09/28/2001	Kazuyoshi Aramaki	040302-0277	3491
22428	7590	03/25/2004	EXAMINER	
FOLEY AND LARDNER			WILLS, MONIQUE M	
SUITE 500			ART UNIT	
3000 K STREET NW			PAPER NUMBER	
WASHINGTON, DC 20007			1746.	

DATE MAILED: 03/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/964,676

Applicant(s)

ARAMAKI, KAZUYOSHI

Examiner

Wills M Monique

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/28/01 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Foreign Priority

Japanese foreign priority document(s) 2000-304673, filed October 4, 2002 and submitted under 35 U.S.C. 119(a)-(d), has/have been received and placed of record in the file.

The Applicant should submit a certified English translation of the foreign priority document to overcome the rejections below, so that it can be ascertained whether the subject matter of the application being instantly claimed is the same as that of the foreign priority document.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1,2,13 –14 &16 are rejected under 35 U.S.C. 102(e) as being anticipated by Wheat et al. U.S. Pub. 2002/0164508.

Wheat et al. teach an electronic by-pass of fuel cell cathode to a combustor (abstract). With respect to claims 1 & 16, Wheat teaches a fuel cell system comprising: a fuel cell (56) supplied with air and fuel to generate electric power output (§ 23); a main air-flow passage (60) supplying air to the fuel cell (§27); an air treatment unit (54) located in the main air-flow passage; a bypass flow passage (80) connected to the main air-flow passage in parallel with the air treatment unit (54); and a flow-passage change-over valve (84) executing a change-over between the main air-flow passage and the bypass flow passage. See Figure 3A. With respect to claims 2, & 14, the diameter of the bypass line should be smaller than the main valve so that flow is split between the paths (§ 39). With respect to claim 16, Wheat illustrates in Fig. 4B, that the humidification system provides controlling means (90) for executing a change-over between the main passage and the bypass passage (112). Regarding claim 13, the fuel cell system further comprises a humidifier located downstream of junction (84) where the main air-flow passage and the bypass flow passage merge (Fig. 4A). The prior art of Wheat anticipates the instant claims as set forth. The limitation in claims 1 & 16 with respect to the bypass flow passage supplying air to the fuel cell during a start-up operation until a predefined condition is established, is considered to be inherent in the fuel cell system as set forth in the prior art, because Wheat employs a bypass flow valve to maintain a certain level of humidification, or predefined condition, for properly operating the fuel cell (§17). This method can be applied anytime during operation of the fuel cell including start-up, shut-down and normal operation.

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Therefore, anticipating the bypass flow passage supplying air to the fuel cell during start-up operation until a predefined condition is established.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 13 & 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Wheat et al. U.S. Pub. 2002/0164509.

Wheat et al. teach an electronic by-pass of gas around the humidifier to the fuel cell stack (abstract). With respect to claims 1 & 16, Wheat teaches a fuel cell system comprising: a fuel cell (56) supplied with air and fuel to generate electric power output (¶ 23); a main air-flow passage (60) supplying air to the fuel cell (¶ 22 & 23); an air treatment unit (54) located in the main air-flow passage; a bypass flow passage (80) connected to the main air-flow passage in parallel with the air treatment unit (54); and a flow-passage change-over valve (84) executing a change-over between the main air-

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flow passage and the bypass flow passage. See Figure 4A. With respect to claim 16, Wheat illustrates in Fig. 4B, that the humidification system provides controlling means (90) for executing a change-over between the main passage and the bypass passage (112). Regarding claim 13, the fuel cell system further comprises a humidifier located downstream of junction (100) where the main air-flow passage and the bypass flow passage merge (Fig. 4A). The prior art of Wheat anticipates the instant claims as set forth. The limitation in claims 1 & 16 with respect to the bypass flow passage supplying air to the fuel cell during start-up until a predefined condition is established, is considered to be inherent in the fuel cell system as set forth in the prior art, because Wheat employs a bypass flow valve to maintain a certain level of humidification, or predefined condition, for properly operating the fuel cell (¶24). This method can be applied anytime during the operation of the fuel cell including start-up, shut-down and normal operation. Therefore, anticipating the bypass flow passage supplying air to the fuel cell during start-up operation until a predefined condition is established.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wheat et al. U.S. Pub. 2002/0164509 as applied to claim 1 above, and further in view of Raiser U.S. Patent 6,616,424.

Wheat teaches the invention claimed in claim 1, as described hereinabove. The reference also teaches that air is typically supplied to the fuel cell by a compressor (¶25).

The reference does not expressly disclose that the compressor comprises: a motor driving the compressor; start-up battery supplying electric power to the motor during start-up operation; and a power supply change-over switch allowing the start-up battery to be changed over to the fuel cell, so that the fuel cell supplies electrical power to the motor when it detects that the fuel cell has reached a state to generate the electric power at a given amount.

However, Raiser teaches a compressor drive system for a fuel cell comprising: a motor (12) driving the compressor; start-up battery (50) supplying electric power to the motor during start-up operation; and a power supply change-over switch (52) supplying power to the motor by switching from the start-up battery to the fuel cell. See the Abstract, col. 5, lines 60-68 & col. 6, lines 1-5. The compressor assembly beneficially operates in such a way that the electric motor which drives the compressor can be driven with electrical energy from a low voltage battery in a cost-favorable manner, reducing operation cost during start-up (col. 2, lines 25-45).

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the instant invention was made to employ the compressor system of Raiser in the humidification system of Wheat, because Raiser teaches that the compressor assembly beneficially operates in such a way that the electric motor, which drives the compressor, can be driven with electrical energy from a low voltage battery in a cost-favorable manner, reducing operation cost during start-up.

With respect to the limitation concerning the power supply change-over switch executing change-over when the fuel cell has reached an operating state to generate electric power at a given amount, the system is specifically geared toward start-up operations and the battery is supplied, temporarily, as a means for supplying electricity to the motor. It would be reasonable to expect that a given amount of power must be supplied by the fuel cell before the supply switch can change over electricity from the battery to the fuel cell. If the switch operates before said amount is achieved, the fuel cell will not be able to power the motor.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wheat et al. U.S. Pub. 2002/0164508 as applied to claim 1 above, and further in view of Raiser U.S. Patent 6,616,424.

Wheat teaches the invention claimed in claim 1, as described hereinabove. The reference also teaches that air is typically supplied to the fuel cell by a compressor (¶27).

The reference does not expressly disclose that the compressor comprises: a motor driving the compressor; start-up battery supplying electric power to the motor during start-up operation; and a power supply change-over switch allowing the start-up battery to be changed over to the fuel cell to supply electric power to the motor when it detects that the fuel cell has reached a state to generate the electric power at a given amount.

However, Raiser teaches a compressor drive system for a fuel cell comprising: a motor (12) driving the compressor; start-up battery (50) supplying electric power to the motor during start-up operation; and a power supply change-over switch (52) supplying power to the motor by switching from the start-up battery to the fuel cell. See the Abstract, col. 5, lines 60-68 & col. 6, lines 1-5. The compressor assembly beneficially operates in such a way that the electric motor which drives the compressor can be driven with electrical energy from a low voltage battery in a cost-favorable manner, reducing operation cost during start-up (col. 2, lines 25-45).

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the instant invention was made to employ the compressor system of Raiser in the humidification system of Wheat, because Raiser teaches that the compressor assembly beneficially operates in such a way that the electric motor, which drives the compressor, can be driven with electrical energy from a low voltage battery in a cost-favorable manner, reducing operation cost during start-up.

With respect to the limitation concerning the power supply change-over switch executing change-over when the fuel cell has reached an operating state to generate electric power output at a given amount, the system is specifically geared toward start-up operations and the battery is supplied, temporarily, as a means for supplying electricity to the motor. A given amount of power must be supplied by the fuel cell before the supply switch can change over the electricity from the battery to the fuel cell. If the switch operates before said amount is achieved, the fuel cell will not be able to power the motor.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 4,5, 9,11-12 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheat et al. U.S. Pub. 2002/0164509, as applied to claim 1 above, in view of Katagiri et al. U.S. Pub. 2001/0010871.

Wheat teaches a humidification system (air treatment unit) for fuel cells as described hereinabove.

The reference is silent to air treatment unit that includes: a heat exchanger (claims 4 & 15); a silencer (claims 5 & 15); a pressure gauge measuring the air pressure (claim 9); a temperature sensor measuring the temperature of air supplied to the fuel cell (claim 11) or filter located down stream of a junction of the by-pass flow valve (claim 12).

Katagiri teaches a humidifying system (air treatment system) for a fuel cell comprising: a heat exchanger (2); silencer (13); filter (14); humidifier 4; temperature sensor (16) and pressure sensor (pressure gauge) (17). See paragraph 53. The reference teaches the use of said humidification system (air treatment system) to properly humidify the fuel cell system in order to increase efficiency of power generation from the fuel cell (¶16).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the instant invention was made to employ the air treatment system of Katagiri in the fuel cell system of Wheat, in order to increase efficiency of power generation from the fuel cell. As evidenced by Katagiri, it is well known in the art to control

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operational parameters of air treatment units by managing the pressure, temperature, noise control and cleanliness of air being treated and charged to the fuel cell.

With respect to claims 9 & 11-12, each claim requires that the measuring component is down stream from the junction where the main air-flow passage and the by pass flow passage merge. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the measuring components down stream from the junction where the main air-flow passage and by-pass flow passage merge, since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70. Stated differently, although the combination of references do not expressly disclose the location of measuring devices, it would have been obvious to employ them down stream from the junction, because this would require a mere rearrangement of parts.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 6,7,8 & 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheat et al. U.S. Pub. 2002/0164509 , as applied to claim 1 above, in view of Katagiri et al. U.S. Pub. 2001/0010871.

Wheat teaches a humidification system (air treatment) for fuel cells as described hereinabove, including a flow sensor (meter) 78 that measures the flow rate of the gas stream (claim 7). See paragraph 31.

The reference is silent to the change-over valve executing a change-over between the main air-flow passage and the bypass flow passage in response to: pressure of the air supplied to the fuel cell (claim 8); temperature of the air supplied to the fuel cell (claim 10); or flow rate (claim 6).

Katagiri teaches a humidification system comprising a flow rate sensor 15, temperature sensor 16, pressure sensor 17 and pressure-regulating valve 18 (¶ 53-54). Katagiri discloses that high pressure and increased flow velocity should be maintained for efficient humidification of air flow to the fuel cell (¶18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the pressure, temperature and flow rate responsive system of Katagiri, in the air treatment system of Wheat, in order to maintain efficient humidification (air treatment) of air flow to the fuel cell. With respect to the temperature, pressure and flow rate responsive systems of claims 6-8 & 10, Katagiri illustrates the use of employing pressure, temperature and flow rate

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measures in order to regulate humidification efficiency of the air stream charged to the fuel cell.

Conclusions

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Keskula et al. U.S. Patent 6,670,064 teaches an air supply pressure set point determination for a fuel cell power module. Moyozono et al. U.S. Patent 6,638,652 teaches a fuel cell control apparatus. Peschke et al. U.S. Patent 6,451,467 teaches a flow control subsystem for a fuel cell system.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (571) 272-1309. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.


If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Randy Gulakowski, may be reached at 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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